NEW FERDINAND RESERVOIR

Dubois County

2007 Fish Management Report

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EXECUTIVE SUMMARY

- New Ferdinand Reservoir is a 10.9-acre impoundment located 1.5 mi east of the Town of Ferdinand in Dubois County.

- A general survey was conducted on June 11 and 12, 2007. Submersed aquatic vegetation was sampled on July 25.

- The Secchi disk depth was 1.9 ft and DO concentrations were marginal for fish survival below 4.0 ft. The conductivity was 194 µS.

- No submersed vegetation was found. A dense planktonic algae bloom was present making the lake appear green and preventing light penetration. The only emergent species observed was cattail sp.

- A total of 509 fish, representing five species and one hybrid, was collected that weighed an estimated 92 lbs. Bluegill ranked first by number (80%), followed by largemouth bass (10%), and redear sunfish (8%). Bluegill ranked first by weight (50%), followed by largemouth bass (36%), and redear sunfish (11%). Black crappie, warmouth, and hybrid sunfish were also collected.

- Bluegill growth improved from 2005 and was fast for all ages with age-3 and age-4 bluegill averaging 6.3 and 6.8 in. Largemouth bass growth was excellent with age-3 and age-5 bass averaging 12.8 and 16.4 in.

- New Ferdinand Reservoir provides good fishing for bluegill and largemouth bass. Bluegill continue to have good growth and 18% were 7.0 in or longer. The largemouth bass population is exhibiting excellent growth and there was a slight increase in the proportion of legal size bass.

- The Town of Ferdinand should explore options available through the DFW-Lake and River Enhancement program (LARE) to improve the lake and its watershed, a LARE biologist can be reached at 317-233-3871.

- Largemouth bass minimum length limit signs will be given to the Town for posting at the boat ramp.

INTRODUCTION

New Ferdinand Reservoir is a 10.9-acre impoundment located 1.5 mi east of the Town of Ferdinand in Dubois County. The lake was constructed in 1954 and was once used as a water supply lake. The shoreline is mostly wooded. Boat access is provided by a gravel boat ramp and shoreline fishing areas are present along the dam and near the ramp. There are no boat launching or access fees. Outboard motors are not allowed to be used.

The 2005 general survey revealed high bluegill density with good growth and low largemouth bass density with average growth. The bluegill PSD was 1, which was artificially depressed by the high number of age-2 bluegill in the population. The largemouth bass electrofishing rate was 87.0/hr and only two bass greater than 14.0 in were sampled. No aquatic vegetation was found due to a dense planktonic algae bloom.

METHODS

A general survey was conducted on June 11 and 12, 2007. Some of the lake's physical and chemical characteristics were measured. Submersed aquatic vegetation was sampled on July 25 using guidelines written by the Indiana Department of Natural Resources (2006).

Fish collection effort consisted of pulsed DC night electrofishing with two dippers for 0.5 h, one trap net lift, and two experimental-mesh gill net lifts. All fish collected were measured to the nearest 0.1 in TL. Average weights were estimated by using the Fish Management District 7 averages. Scale samples were taken from a subsample of game fish for age and growth analysis. Proportional stock density (PSD) and relative stock density (RSD) indices were calculated for bluegill (Anderson and Neumann 1996). They were not calculated for bass due to the low number sampled. The bluegill fishing potential index (BGFP) was used to classify the quality of the bluegill fishery (Ball and Tousignant 1996). All sampling was done in accordance with the Division of Fish and Wildlife (DFW) sampling guidelines (Shipman 2001).

RESULTS

New Ferdinand Reservoir has a maximum depth of 15.0 ft. The Secchi disk depth was 1.9 ft and DO concentrations were marginal for fish survival below 4.0 ft. The conductivity was 194 µS.

No submersed vegetation was found. A dense planktonic algae bloom was present making the lake appear green and preventing light penetration. The only emergent species observed was cattail sp.

A total of 509 fish, representing five species and one hybrid, was collected that weighed an estimated 92 lbs. Bluegill ranked first by number (80%), followed by largemouth bass (10%), and redear sunfish (8%). Bluegill ranked first by weight (50%), followed by largemouth bass (36%), and redear sunfish (11%). Black crappie, warmouth, and hybrid sunfish were also collected. Species collected in past surveys include black bullhead, brown bullhead, channel catfish, and white crappie.

A total of 408 bluegill was collected that weighed 46 lbs. They ranged in length from 1.5 to 8.0 in. The catch rates were 538.0/electrofishing h (excluding age 0), 41.0/trap net lift, and 40.0/gill net lift. The 2005 electrofishing catch rate was 1,668.4/h (excluding age 0). Bluegill growth improved from 2005. Growth was fast for all ages with age-3 and age-4 bluegill averaging 6.3 and 6.8 in compared to 5.4 and 6.2 in in 2005.

The bluegill PSD substantially increased from 1 (2005) to 27. The suggested PSD range indicating a balanced bluegill fishery is 20 to 60 (Anderson and Neumann 1996). The RSD-7 and RSD-8 were both zero. However, a combined total of 74 bluegill was collected in both gill and trap nets that were at least 7.0 in. The BGFP index increased from 10 (2005) to 25 and classified the lake as having “good” bluegill fishing.

A total of 52 largemouth bass was collected that weighed 34 lbs. They ranged in length from 1.7 to 17.5 in. The catch rates were 100.0/electrofishing h, 0.0/trap net lift, and 1.0/gill net lift. The electrofishing catch rate in 2005 was 80.7/h. Thirteen percent of the bass were greater than 14.0 in versus 11% in 2005. Largemouth bass growth was excellent with age-3 and age-5 bass averaging 12.8 and 16.4 in. In 2005 growth was average.

A total of 38 redear sunfish was collected that weighed 10 lbs. They ranged in length from 3.4 to 9.5 in. The catch rates were 36.0/electrofishing h, 18.0/trap net lift, and 1.0/gill net lift. Redear growth was good with age-2 and age-3 fish averaging 6.5 and 7.0 in.

A total of 5 black crappie was collected that weighed 2 lbs. They ranged in length from 8.6 to 9.8 in. Crappie growth was good.

DISCUSSION

New Ferdinand Reservoir provides good fishing for bluegill and largemouth bass. Bluegill continue to have good growth and 18% were 7.0 in or longer. The largemouth bass population is exhibiting excellent growth and there was a slight increase in the proportion of legal size bass.

Bluegill densities have been reduced by more than half since the 2005 survey. However, bluegill are dominating the fishery with seven times as many bluegill as bass. The high numbers are a result of reduced predation risk caused by the turbid water (Miner and Stein 1996). The reduced predation leads to increased recruitment, thus increased numbers. Even with the high densities, bluegill growth should remain good due to the lake's high productivity.

The largemouth bass electrofishing catch is low, as it was in 2005. Catch rates at this lake should be at least 200.0/h. This may be due to harvest or reduced sampling efficiency due to the low visibility created by the plankton bloom. Largemouth bass minimum length limit signs will be given to the Town so they can post one at the boat ramp.

A dense planktonic algae bloom is still occurring in this lake. Planktonic algae has shaded out rooted aquatic vegetation and, if left in the current state, could result in fish kills during an extended period of warm, overcast days. The cause of the algae bloom is most likely excessive nutrient runoff from farms or confined feeding operations within the watershed. This runoff is also depositing sediment in the west end of the lake causing the lake to fill in. Excessive nutrient loading and sediment deposits need to be reduced. The Town of Ferdinand should explore options available through the DFW-Lake and River Enhancement program (LARE) to improve the lake and its watershed. Funding for approved LARE projects are done on a cost-share basis. For questions and more information on submitting LARE proposals a LARE biologist can be reached at 317-233-3871.

RECOMMENDATIONS

- The Town of Ferdinand should explore options available through the DFW-Lake and River Enhancement program (LARE) to improve the lake and its watershed, a LARE biologist can be reached at 317-233-3871.

- Largemouth bass minimum length limit signs will be given to the Town for posting at the boat ramp.

LITERATURE CITED

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Miner, G. M., and R. A. Stein. 1996. Detection of predators and habitat choice by small bluegills: effects of turbidity and alternative pretty. Transactions of the American Fisheries Society. 125:97-103.

Shipman, S. 2001. Manual of fishery survey methods. Indiana Department of Natural Resources. Indianapolis, Indiana. 67 pp.

Submitted by: Michelle L. Weinman, Assistant Fisheries Biologist

Date: September 19, 2007

Approved by: Daniel P. Carnahan, Fisheries Biologist

Date: October 22, 2007

Approved by: Brian M. Schoenung, Fisheries Supervisor

Date: January 30, 2008

Appendix

Fisheries Survey Data

LAKE SURVEY REPORT

Type of Survey: [ ] Initial Survey [X] Re-Survey

Lake Name	County	Date of survey (Month, day, year)
New Ferdinand Reservoir	Dubois	June 11 and 12, 2007
Biologist's name		**Date of approval (Month, day, year)**
Michelle L. Weinman		January 30, 2008

LOCATION

Quadrangle Name	Range	Section
Saint Meinrad	4W	34
Township Name	**Nearest Town**	
3S	Ferdinand	

ACCESSIBILITY

State owned public access site	Privately owned public access site	Other access site
None	None	City owned gravel boat ramp

Surface acres	Maximum depth	Average depth	Acre feet	Water level	Extreme fluctuations
10.9	15.0	6.0	65.4	485.0 MSL	None

Location of benchmark

INLETS

Name	Location	Origin
Intermittent stream	S34, NE, SW, NW	Pond S27, SW, SW, SE

OUTLETS

Name	Location
Ferdinand Run	S34, NE, SE, NW

Water level control: Concrete spillway: pump to Old Ferdinand Reservoir

POOL	ELEVATION (Feet MSL)	ACRES
TOP OF DAM		
TOP OF FLOOD CONTROL POOL		
TOP OF CONSERVATION POOL	485.0	10.9
TOP OF MINIMUM POOL		
STREAMBED		

Bottom type

- [ ] Boulder
- [ ] Gravel
- [ ] Sand
- [X] Muck
- [ ] Clay
- [ ] Marl

Watershed use: Agriculture

Development of shoreline: None

Previous surveys and investigations: Fish management surveys: 1977, 1985, and 2005.

SAMPLING EFFORT					
ELECTROFISHING	Day hours		Night hours 0.5		Total hours 0.5
TRAP NETS	Number of traps 1		Number of Lifts 1		Total effort 1 overnight lift
GILL NETS	Number of nets 2		Number of Lifts 1		Total effort 2 overnight lifts
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

PHYSICAL AND CHEMICAL CHARACTERISTICS	
Color: Green (plankton bloom)	Turbidity: 1 Feet 11 Inches (SECCHI DISK)
Alkalinity (ppm)*: Surface: 51.3 Bottom: 68.4	pH: Surface: 10.2 Bottom: 7.2
Conductivity: 194 microsiemens	Air temperature: 82 °F
Water chemistry GPS coordinates: N 38.21517	W -86.83377

TEMPERATURE AND DISSOLVED OXYGEN (D.O.)								
DEPTH (FEET)	Degrees (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)
SURFACE	78.0	13.1	36			72		
2	78.0	12.6	38			74		
4	77.0	4.7	40			76		
6	72.5	1.3	42			78		
8	67.5	1.2	44			80		
10	58.0	0.6	46			82		
12	54.5	0.6	48			84		
14	52.0	0.5	50			86		
15	52.0	0.5	52			88		
18			54			90		
20			56			92		
22			58			94		
24			60			96		
26			62			98		
28			64			100		
30			66					
32			68					
34			70					

COMMENTS

*ppm-parts per million

Occurrence and Abundance of Submersed Aquatic Plants - Overall

Lake:	New Ferdinand	**Secchi (ft):**	1.5	**SE Mean Species / Site:**	0.00
Date:	7/25/2007	**Littoral Sites w/Plants:**	0	**Mean Natives / Site:**	0.00
Littoral Depth (ft):	0.0	**Number of Species:**	0	**SE Mean Natives / Site:**	0.00
Littoral Sites:	0	**Max. Species / Site:**	0	**Species Diversity:**	
Total Sites:	30	**Mean Species / Site:**	0.00	**Native Diversity:**	

Species	Frequency of Occurrence	Score Frequency 0	1	3	5	Dominance
No submergents found						

Other plants observed:
Cattail sp.

SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT					
*COMMON NAME OF FISH	NUMBER	PERCENT	LENGTH RANGE (inches)	WEIGHT (pounds)	PERCENT
Bluegill	408	80.2	1.5 - 8.0	46.20	50.0
Largemouth bass	52	10.2	1.7 - 17.5	33.57	36.3
Redear sunfish	38	7.5	3.4 - 9.5	9.75	10.5
Black crappie	5	1.0	8.6 - 9.8	2.23	2.4
Warmouth	4	0.8	5.5 - 6.8	0.40	0.4
Hybrid sunfish	2	0.4	6.1 - 6.2	0.34	0.4
Totals	509			92.49	

*Common names of fishes recognized by the American Fisheries Society.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF BLUEGILL									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5	18	4.4	0.01	0	19.5				
2.0	67	16.4	0.01	1	20.0				
2.5	48	11.8	0.01	1	20.5				
3.0	13	3.2	0.02	1	21.0				
3.5	31	7.6	0.03	1, 2	21.5				
4.0	5	1.2	0.05	1, 2	22.0				
4.5	21	5.1	0.07	2, 3	22.5				
5.0	30	7.4	0.09	2, 3	23.0				
5.5	39	9.6	0.13	2, 3, 4	23.5				
6.0	30	7.4	0.17	3, 4	24.0				
6.5	31	7.6	0.22	2, 3, 4	24.5				
7.0	55	13.5	0.28	2, 3, 4	25.0				
7.5	19	4.7	0.34	3, 4	25.5				
8.0	1	0.2	0.41	4	26.0				
8.5					TOTAL	408			
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	574.0/h	GILL NET CATCH	40.0/lift	TRAP NET CATCH	41.0/lift

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5	1	1.9	0.01	not aged	19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5					22.5				
5.0					23.0				
5.5					23.5				
6.0					24.0				
6.5					24.5				
7.0	3	5.8	0.16	1	25.0				
7.5	1	1.9	0.20	2	25.5				
8.0	4	7.7	0.24	1, 2	26.0				
8.5	9	17.3	0.28	1, 2	TOTAL	52			
9.0	12	23.1	0.33	1, 2					
9.5	3	5.8	0.39	1, 2					
10.0	2	3.8	0.46	2					
10.5	4	7.7	0.71	1, 2					
11.0	3	5.8	0.62	2, 3					
11.5	1	1.9	0.71	2					
12.0									
12.5									
13.0	1	1.9	1.02	3					
13.5	1	1.9	1.15	3					
14.0									
14.5									
15.0	1	1.9	1.68	4					
15.5	1	1.9	1.88	5					
16.0	1	1.9	2.08	5					
16.5	2	3.8	2.40	5					
17.0	1	1.9	2.56	7					
17.5	1	1.9	2.77	6					
18.0									
18.5									

ELECTROFISHING CATCH	100.0/h	GILL NET CATCH	1.0/lift	TRAP NET CATCH	0.0/lift

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF REDEAR SUNFISH									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0	1	2.6	0.02	1	21.0				
3.5					21.5				
4.0	1	2.6	0.05	2	22.0				
4.5					22.5				
5.0	5	13.2	0.09	2, 3	23.0				
5.5	4	10.5	0.13	2	23.5				
6.0	1	2.6	0.17	2	24.0				
6.5	5	13.2	0.22	2, 3	24.5				
7.0	11	28.9	0.27	2, 3	25.0				
7.5	4	10.5	0.33	2, 3	25.5				
8.0					26.0				
8.5	4	10.5	0.48	4	TOTAL	38			
9.0	1	2.6	0.57	5					
9.5	1	2.6	0.66	4					
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	36.0/h	GILL NET CATCH	1.0/lift	TRAP NET CATCH	18.0/lift

BLUEGILL AGE-LENGTH KEY

Length group (in)	Total number	Sub-sample	AGE 1	2	3	4	5
1.5	18	5					
2.0	67	6	67				
2.5	48	6	48				
3.0	13	7	13				
3.5	31	5	25	6			
4.0	5	4	4	1			
4.5	21	5		8	13		
5.0	30	8		15	15		
5.5	39	7		11	22	6	
6.0	30	8			19	11	
6.5	31	6		5	5	21	
7.0	55	10		17	32	6	
7.5	19	6			6	13	
8.0	1	1					1
Totals	408	84	157	64	112	56	1

AGE-LENGTH KEY SUMMARY						
Age	Number	Mean TL	Var	SE	Lower 95%CI	Upper 95%CI
1	157	2.8	0.36	0.05	2.7	2.9
2	64	5.7	1.31	0.14	5.5	6.0
3	112	6.3	0.87	0.09	6.1	6.4
4	56	6.8	0.40	0.09	6.7	7.0
5	1	8.3				

LARGEMOUTH BASS AGE-LENGTH KEY

Length group (in)	Total number	Sub-sample	AGE						
			1	2	3	4	5	6	7
7.0	3	2	3						
7.5	1	1		1					
8.0	4	4	3	1					
8.5	9	9	5	4					
9.0	12	8	11	2					
9.5	3	3	2	1					
10.0	2	2		2					
10.5	4	3	1	3					
11.0	3	3		2	1				
11.5	1	1		1					
12.0									
12.5									
13.0	1	1			1				
13.5	1	1			1				
14.0									
14.5									
15.0	1	1				1			
15.5	1	1					1		
16.0	1	1					1		
16.5	2	2					2		
17.0	1	1							1
17.5	1	1						1	
Totals	51	45	25	16	3	1	4	1	1

AGE-LENGTH KEY SUMMARY						
Age	Number	Mean TL	Var	SE	Lower 95%CI	Upper 95%CI
1	25	8.9	0.71	0.17	8.6	9.2
2	16	9.8	1.47	0.30	9.2	10.4
3	3	12.8	1.75	0.76	11.2	14.3
4	1	15.3				
5	4	16.4	0.23	0.24	15.9	16.9
6	1	17.8				
7	1	17.3				

REDEAR SUNFISH AGE-LENGTH KEY

Length	Total	Sub-	AGE				
group (in)	number	sample	1	2	3	4	5
3.0	1	1	1				
3.5							
4.0	1	1		1			
4.5							
5.0	5	5		4	1		
5.5	4	4		4			
6.0	1	1		1			
6.5	5	5		4	1		
7.0	11	10		7	3		
7.5	4	3		2	1		
8.0							
8.5	4	4				4	
9	1	1					1
9.5	1	1				1	
Totals	38	36	1	23	6	5	1

AGE-LENGTH KEY SUMMARY						
		Mean			Lower	Upper
Age	Number	TL	Var	SE	95%CI	95%CI
1	1	3.3				
2	23	6.5	0.96	0.20	6.1	6.9
3	6	7.0	0.72	0.33	6.3	7.6
4	5	9.0	0.20	0.20	8.6	9.4
5	1	9.3				

GPS LOCATION OF SAMPLING EQUIPMENT									
GILL NETS			TRAP NETS			ELECTROFISHING			
1	N 38.21505	W -86.83555	1	N 38.21440	W -86.83640	1	N 38.21582	W -86.83457
2	N 38.21535	W -86.83488	2	N	W		N 38.21460	W -86.83645
3	N	W	3	N	W	2	N 38.21453	W -86.83635
4	N	W	4	N	W		N 38.21518	W -86.83347
5	N	W	5	N	W	3	N	W
6	N	W	6	N	W		N	W
7	N	W	7	N	W	4	N	W
8	N	W	8	N	W		N	W
9	N	W	9	N	W	5	N	W
10	N	W	10	N	W		N	W
11	N	W	11	N	W	6	N	W
12	N	W	12	N	W		N	W
13	N	W	13	N	W	7	N	W
14	N	W	14	N	W		N	W
15	N	W	15	N	W	8	N	W
16	N	W	16	N	W		N	W
17	N	W	17	N	W	9	N	W
18	N	W	18	N	W		N	W
19	N	W	19	N	W	10	N	W
20	N	W	20	N	W		N	W
						11	N	W
							N	W
						12	N	W
							N	W
						13	N	W
							N	W
						14	N	W
							N	W
						15	N	W
							N	W
						16	N	W
							N	W
						17	N	W
							N	W
						18	N	W
							N	W
						19	N	W
							N	W
						20	N	W
							N	W